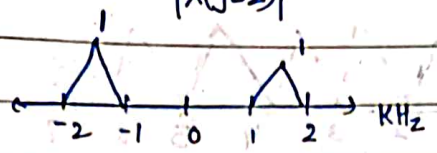
22B1232

Date
Page

Class Test

Q:>

A:> $|X(j\Omega)|$ $\quad \angle X(j\Omega) = 0 \ \forall \ \Omega$ $\quad 10/10$



(1) $x(t) \sum_{l=-\infty}^{+\infty} \delta(t - lT_s)$ $\quad \frac{1}{T_s} = 2KHz, \quad \frac{1}{T_s} = 5KHz$

$= \sum_{l=-\infty}^{+\infty} x(lT_s)\ \delta(t - lT_s)$

$x(t) \sum \frac{1}{T_0} e^{j \cdot \frac{2\pi}{T_0} l t}$

↓ Fourier series of $\delta(t - lT_s)$

The F.T. is obtained as →

$x(t) \longrightarrow X(j\Omega)$

$\frac{1}{T_0} x(t) \longrightarrow \frac{1}{T_0} X(j\Omega)$

$\frac{1}{T_0} x(t) \cdot e^{-\frac{2\pi}{T_s} jlt} \longrightarrow \frac{1}{T_0} X\left(j\left(\Omega - \frac{2\pi}{T_s} l\right)\right)$

So, $F.T. = \frac{1}{T_s} X\left(j\left(\Omega - \left(\frac{2\pi}{T_s}\right) l\right)\right)$

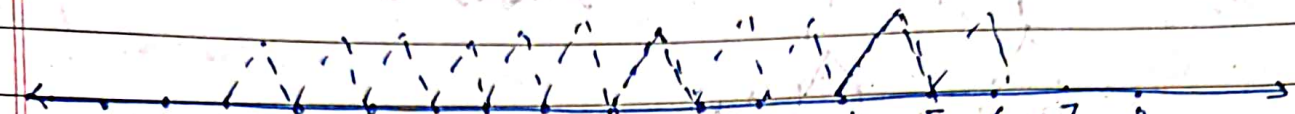
$= \frac{1}{T_s} X\left(j\left(2\pi\left(f - f_s \cdot l\right)\right)\right)$

$= \frac{1}{T_s} \left(X\left(2\pi j\left(f - l f_s\right)\right)\right)$

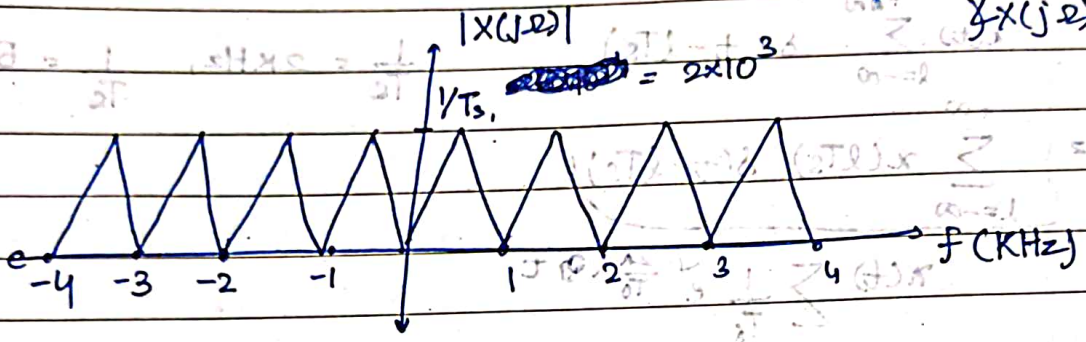
When $f_s = 2KHz$, $l = 0 \rightarrow \frac{1}{T_s}\left(X\left(2\pi j (f)\right)\right)$

$l = 1 \rightarrow \frac{1}{T_s}\left(X(2\pi j (f-2))\right)$

$l = -1 \rightarrow \frac{1}{T_s}\left(X\left(2\pi j (f+2)\right)\right)$



$\angle X(j\Omega) = 0$



(b) $1/T_S = 5KHz$ $5 > (f^+ - f^+ = 4KHz)$

$\angle X(j\Omega) = 0$